

CLAIMS

I claim:

1. A seal for sealing a dynamic shaft assembly, comprising:

a sleeve adapted to be disposed generally coaxially around a shaft;

a casing adapted to be generally arranged to surround the sleeve;

a faceplate, located between the sleeve and the casing, having an inside face and an outside face, the faceplate generally perpendicular to the sleeve; and

at least one flexible member operably coupled to the casing, and contacting the inside face of the faceplate.

2. The seal of claim 1, further comprising a first flange extending radially inwardly from and being generally perpendicular to the casing.

3. The seal of claim 2, further comprising a perimeter lip extending radially inwardly from the first flange.

4. The seal of claim 3, wherein the at least one flexible member and the perimeter lip are constructed at least in part with an elastomeric material.

5. The seal of claim 1, further comprising a main sealing lip in contact with the casing.

6. The seal of claim 5, wherein the main sealing lip is constructed at least in part with an elastomeric material.

7. The seal of claim 5, wherein the main sealing lip is biased.

8. The seal of claim 7, wherein the main sealing lip is biased with a garter spring.

9. The seal of claim 1, further comprising a triple lip seal in contact with the casing.

10. The seal of claim 9, wherein the triple lip seal is constructed at least in part with an elastomeric material.

11. The seal of claim 1, further comprising at least one excluder lip in contact with the casing.

12. The seal of claim 11, wherein the at least one excluder lip is constructed at least in part with an elastomeric material.

13. The seal of claim 1, further comprising a second flange extending radially outwardly from, and generally perpendicular to the sleeve.

14. The seal of claim 1, wherein the faceplate is generally planar.

15. The seal of claim 14, wherein the faceplate has a central aperture larger than the diameter of the shaft.

16. The seal of claim 14, wherein the faceplate is made primarily of metal and has a wiper ring extending radially outwardly from one end of the faceplate.

17. The seal of claim 16, wherein the wiper ring is made at least in part with an elastomeric material.

18. The seal of claim 1, wherein the at least one flexible member has a triangular cross section.

19. The seal of claim 1, wherein an inside diameter area of the sleeve is coated at least in part with an elastomeric material.

20. The seal of claim 19, wherein the coating of the inside diameter area of the sleeve has a radial channel formed generally medial the two ends of the sleeve.

21. The seal of claim 19, wherein the inner end of the coating is chamfered.

22. The seal of claim 1, wherein an outside diameter area of the casing is coated at least in part with an elastomeric material.
23. The seal of claim 22, wherein a casing outside diameter relief channel is formed in the coating proximate an outer end of the casing.
24. The seal of claim 22, wherein an end of the coating is chamfered.
25. The seal of claim 1, further comprising a water-resistant material that fills in all of the open space between the sleeve and casing.
26. The seal of claim 25, wherein the water-resistant material is grease.
27. A seal for sealing a dynamic shaft assembly, comprising:
 - a sleeve adapted to be disposed generally coaxially around a shaft;
 - a casing adapted to be generally arranged to surround the sleeve;
 - a faceplate having an inside face and an outside face, the faceplate operably coupled to and generally perpendicular to one end of the sleeve;
 - a first flange extending radially inwardly from and being generally perpendicular to the casing;
 - and
 - at least one flexible member operably coupled to the first flange, and contacting the inside face of the faceplate.
28. The seal of claim 27, further comprising a second flange extending radially outwardly from the sleeve.

29. The seal of claim 28, further comprising a main sealing lip operably coupled to the second flange, and in contact with the casing, whereby the main sealing lip is biased against the casing with a garter spring.

30. The seal of claim 29, wherein at least one of the following is constructed at least in part with an elastomeric material: the at least one flexible member, the main sealing lip, a coating on the outside diameter of the casing, a coating on the inside diameter of the sleeve.

31. A method of making a seal, the seal comprising an inner portion designed to fit around a shaft, the inner portion having a faceplate that is operably coupled to and radiates outwardly from and is generally perpendicular to a sleeve, and an outer portion designed to fit with the inner portion, the method comprising:

attaching at least one flexible member to the outer portion; and

combining the inner and outer portions, whereby the at least one flexible member is located between the inner and outer portions, whereby the at least one flexible member is in contact with the faceplate.

32. The method of claim 31, wherein the outer portion comprises a flange extending radially inwardly from and generally perpendicular to a casing, whereby the flange is operably coupled to the at least one flexible member.

33. The method of claim 32, wherein the outer portion further comprises a perimeter lip extending radially inwardly from the end of the flange.

34. The method of claim 33, wherein the perimeter lip and the at least one flexible member are constructed at least in part with an elastomeric material.

35. The method of claim 31, further comprising filling the space between the inner and outer portions with a water-resistant material.
36. The method of claim 35, wherein the water-resistant material is grease.
37. A seal comprising a housing structure adapted to surround a shaft, wherein the housing structure comprises a means for preventing foreign material from entering the sealed area.
38. The seal of claim 37, wherein the housing structure comprises a sleeve, a casing, and a faceplate, wherein the faceplate is operably coupled to the sleeve.
39. A method for sealing a dynamic shaft assembly containing a bore for receiving a seal, comprising:
 - providing a seal having a faceplate and at least one structure between an inner and an outer portion of the seal that substantially limits foreign particles from entering the seal, wherein the faceplate is operably coupled to the inner portion; and
 - placing the seal into the bore.
40. The method of claim 39, wherein the seal further comprises a first flange extending radially inwardly from the outer portion, and a perimeter lip extending radially inwardly from the first flange.
41. The method of claim 40, wherein the at least one structure and the perimeter lip are constructed of elastomeric material.
42. The method of claim 39, wherein the seal further comprises a main sealing lip.
43. The method of claim 42, wherein the main sealing lip is biased.

45. The method of claim 39, wherein the seal further comprises at least one excluder lip.

46. The method of claim 39, wherein the seal further comprises a second flange extending radially outwardly from, and generally perpendicular to, the inner portion.

47. The method of claim 39, wherein the inner portion has a bore that is coated with an elastomeric coating.

48. The method of claim 39, wherein the outer portion is covered with an elastomeric coating.

49. A seal for sealing a dynamic shaft assembly, comprising:

a sleeve adapted to be disposed generally coaxially around a shaft;

a casing adapted to be generally arranged to surround the sleeve;

a faceplate, located between the sleeve and the casing, having an inside face and an outside face, the faceplate generally perpendicular to the sleeve; and

a filtering material portion, wherein the filtering material portion contacts the inside face of the faceplate.

50. The seal of claim 49, further comprising a first flange extending radially outwardly from the sleeve.

51. The seal of claim 50, further comprising at least one flexible member extending radially outwardly from the first flange.

52. The seal of claim 51, wherein the at least one flexible member is made at least in part with an elastomeric material.
53. The seal of claim 51, further comprising a perimeter lip extending axially inward from the flange.
54. The seal of claim 53, wherein the perimeter lip is constructed at least in part with an elastomeric material.
55. The seal of claim 49, wherein the filtering material portion is felt.
56. The seal of claim 49, wherein the filtering material portion is a synthetic filtering material.
57. The seal of claim 49, further comprising a main sealing lip in contact with the sleeve.
58. The seal of claim 57, wherein the main sealing lip is made at least in part with an elastomeric material.
59. The seal of claim 57, wherein the main sealing lip is biased.
60. The seal of claim 59, wherein the main sealing lip is biased with a garter spring.
61. The seal of claim 49, further comprising a second flange extending radially inwardly from the casing.
62. A seal for sealing a dynamic shaft assembly, comprising:
 - a seal having an inner portion, an outer portion, a faceplate, and at least one flexible member located between the inner and outer portions; and
 - a sleeve extending axially inward from the outer portion, the sleeve dimensioned to house a bearing.

63. The seal of claim 62, wherein the at least one flexible member contacts an inside face of the faceplate.